

COMBAT RATION NETWORK FOR TECHNOLOGY IMPLEMENTATION

Tiromat HFFS Equipment Upgrade

Final Technical Report STP#2003

Results and Accomplishments (April 2002 – November 2004)

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November 2004

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14. ABSTRACT <p>To maintain full functionality and capability of the Tiromat Horizontal Form Fill and Seal Equipment, upgrades have to be performed on a regular basis. Software and hardware have a life cycle after which support by the original vendor terminates. It is not uncommon, that control systems require a significant upgrade after about ten years in service.</p> <p>This project upgraded the Tiromat control system components as well as the capability of the forming station so that quad laminate film structures currently used for the production of MRE shelf stable items can be used on this equipment. While initially it was thought that the upgrades could be performed at the Demo facility, the complexity of the tasks were such that it was deemed to be more efficient and cost effective to ship the equipment to Convenience Food Systems at Frisco TX.</p> <p>The upgrades were completed and the equipment was reinstalled at the CORANET Demonstration Facility in support of research activities for the combat rations</p>						
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Abstract:

To maintain full functionality and capability of the Tiromat Horizontal Form Fill and Seal Equipment that can be supported, upgrades have to be performed on a regular basis. Software and hardware have a life cycle after which support by the original vendor terminates. It is not uncommon, now a days, that control systems require a significant upgrade after about ten years in service.

This project upgraded the Tiromat equipment both in the area of control system components as well as in the area of forming capability for quad laminate film structures currently used for the production of MRE shelf stable items. While initially it was thought that the upgrades could be performed at the Demo facility, the complexity of the tasks were such that it was more cost effective to ship the equipment to Convenience Food Systems at Frisco TX.

The upgrades were completed and the equipment was reinstalled at the CORANET Demonstration Facility in support of research activities for the combat rations

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1 Results and Accomplishments

1.1 Introduction and Background

The Combat Ration Demonstration facility acquired in 1990, a Horizontal Form Fill and Seal Packaging Machine: Tiromat 3000 (serial # 765-3001/440). The Tiromat Equipment was designed to form a MRE pouch from a tri-laminate foil structure. The equipment was successful in qualifying the HFFS principle for MRE application and has led to implementation of this packaging technology at each and every combat ration producer, primarily for placeble products. The Combat Ration Industry has since moved to quad laminate structure for pouch integrity reasons. These quad laminate structures require significant higher forces to be formed compared to the tri-laminate structures. The higher forming forces also require higher clamping forces in order to prevent slippage of the film in the forming mold. The Tiromat equipment had inadequate clamping force and allowed the film to slip in the forming station which resulted in seal wrinkles. The vendor of the equipment suggested various upgrade options that would increase the clamping force and possibly increase the capability of the forming station to form quad laminate structures for MRE application.

In addition to inadequate forming capability, the control system of the Tiromat, based on a DEC PDP-11 operator interface and a PLC-2 logic controller, is not longer supported. The vendor recommended an control system upgrade to an Allen Bradley PLC-5 logic controller with Allen Bradley Panel View Operator Interface

The pouch cutting system used on the Tiromat is based on a knife/anvil system that scorers the pouch, which is not fool-prove and sometimes leads to pouches the need to be separated manually. Newer and more advanced equipment uses a strip punch during which a strip of pouch material is cut away. While this cutting is superior over the knife/anvil system, upgrading our Tiromat to this cutting mechanism, while possible, was cost prohibitive (~\$150,000). Due to the fact that the Tiromat is intended primarily for research production, a decision was made not to pursue the upgrade of the cutting system.

1.2 Objectives

- 1) Upgrade the forming capability of the Tiromat in order to form MRE quad laminate foil structures.
- 2) Upgrade the Tiromat control system to current standard off the shelf available hardware and software components

1.3 Results and Conclusions

The Tiromat Horizontal Form Fill Seal equipment was originally purchased in 1990 and qualified to form MRE pouches from tri-laminate film material. The control system was at that time state of the art and based on PLC-2 logic controller and DEC-PDP-11 operator interface hardware.

Due to post retort pouch integrity issues, the Industry has shifted from tri-laminate to quad laminate film structure. This new pouch structure required that the Tiromat clamping capability needed to be upgraded to avoid slippage of the film during the forming operation.

Convenience Foods Systems, the US vendor of this equipment, upgraded the pouch forming station by adding an air bladder system to the clamp and increasing the clamping force to 15 tons, sufficient to prevent slippage of quad laminate film during the forming stage.

As the equipment was upgraded mechanically, the control hardware and software was also upgraded to current standards: PLC-5 and Panel View 1000, as well as the main servo drive: Emerson PCM-11. These upgrades have improved the reliability of the Tiromat equipment significantly and enabled it to produce high quality quad laminate MRE pouches. This is not only important for the purpose to support R&D activities at the Demo facility, but also important in case of surge, when the equipment might be commissioned in support of production requirements of the combat ration industry

2 Program Management

The project was awarded on April 30th 2002 under SPO103-02-D-0024, Delivery Order 0003 with a obligation of the total requested amount of \$146,093.00. Performance period for this delivery order was set at 6 month (October 30th 2002). The contract was awarded to upgrade the Tiromat 3000 forming station and control station located at the FMT facility.

The following modifications were issued:

Jul 25, 2002	0003/01	Change in address of contractor
Oct 25, 2002	0003/02	No cost extension from October 30 th , 2002 to January 30 th , 2003
Nov 27, 2002	0003/03	De-obligation of funding, decreasing total obligated dollar value to \$46,093.00
Jan 24, 2003	0003/04	No cost extension from January 30 th , 2003 to June 30 th 2003
June 9, 2003	0003/05	No cost extension from June 30 th , 2003 to December 31 th 2003
Dec 23, 2003	0003/06	No cost extension from December 31 th , 2003 to June 30 th , 2004
Jan 31, 2004	0003/07	Change in scope of project. Tiromat will be upgraded at Convenience Food. Total obligated dollar value for project was increased to \$174,521.00
May 24 2004	0003/08	Additional funds (\$24,958.00) added to project to support the upgrade of the Tiromat Drive. Total obligation increased to \$199,481.00
Jun 29, 2004	0003/09	No cost extension from June 30 th , 2004 to September 30 th , 2004
Sep 30, 2004	0003/10	No cost extension from September 30 th , 2004 to November 30 th 2004
Nov 12, 2004	0003/11	Additional funds (\$9,692.00) added to the project to cover expenses associated with extra activities and underestimate of administrative cost.

3 Short Term Project Activities

3.1 Identification of Required Upgrades

Rutgers met with representatives of Convenience Food Systems (CFS) on January 22, 2002, discussing the problems of the Tiromat System with forming quad laminate film structures without film slippage and a control system that is not longer supported. CFS responded with a proposal on 2/28/02 and an amended proposal on 2/19/02. The proposal suggested a phased approach, starting with a segmented clamping plate, followed with a plug assist if the segmented plate could not resolve the forming issues. The proposal also suggested an upgrade of the control system to a PLC-5 with Panel View 1000 Touch Screen Operator Interface in the final phase of the project.

3.2 Installation and Testing of Segmented Clamping Plate

Rutgers issued a purchase order for the segmented clamping plate, which was delivered and installed on 8/19/02. The segmented clamping plate did however not reduce the slippage of the quad laminate film during the forming cycle and the tool was send by CFS to a machine shop for additional adjustment

The segmented clamping plate was reinstalled and tested on 9/3/02 by a CFS technician, but results were still not encouraging. Both the segmented clamping plate and forming bucket were send back to a machine shop for the installation of a "T" shaped rubber in both units

Reinstallation and testing by a CFS technician was performed on 9/26/02 without success. It was concluded that the mechanical clamping mechanism could not create adequate uniform clamping force around the perimeter of the forming bucket.

On October 2, 2002, CFS submitted a proposal to add an airbladder system to increase the clamping force. An airbladder system would allow the forming bucket to adjust itself to small misalignments and negate the need for shims to adjust clamping pressures as function of wear and tear.

However, the proposal did not guarantee success unless significant testing could be done at CFS own facility. After extensive negotiation with CFS, a revised proposal was submitted on April 11, 2003 by CFS, that required the Tiromat equipment to be shipped to CFS at Frisco TX, after which CFS would conduct testing at their expense before proceeding with the project.

3.3 Shipment of Equipment in Support of Surge

In support of Iraqi Freedom, Sterling Foods requested the use of the Tiromat Horizontal Form Fill and Seal equipment at the CORANET Demo facility, to over wrap bakery product. Representative from Sterling Foods visited the facility on 4/17/03 and tested the Tiromat with the film that is being used for bakery product over wrap. This film, a non retortable film, is much easier to form and the Tiromat had no problems forming and over wrapping the product during the test. It was explained however that the control system was not longer supported by the vendor and that a failure of one of the components could be fatal. Knowing this risk Sterling Foods proceeded with their request and the equipment was shipped on May 1, 2003 to Sterling Foods in San Antonio TX. During production the hard disk of the controller did finally crash, making the equipment not longer functional. Spare parts could not be obtained and replacement of the controller in the field was cost prohibitive. The equipment was deactivated and stored till shipment to CFS could be arranged for the equipment upgrade.

3.4 Assessment of Need at CFS

On March 8, 2004, the Tiromat was shipped from Sterling Foods to CFS in Frisco Texas for a forming capability assessment. On March 31, CFS notified Rutgers University that it had completed its tests and that the upgrade will generate sufficient clamping force to successfully form quad laminate film

3.5 Design, Installation and Testing of Upgraded Clamping System

CFS completely rebuild the forming station, including all new pneumatic controls and designed a new clamping system that was based on a combination scissor clamp and air bladder system tot increases the clamping force to 15 tons. Together with the use of high friction gasket material, this clamping force increased the frictional force required to form a quad laminate film structure without slippage. CFS issued design drawings by 4/22/04 and completed the installation of the system in July.

Simultaneous, the control software and hardware were upgraded, using commercial off the shelf items, as well as the replacement of the drive mechanism.

An initial pre-shipment acceptance test was conducted on July 12-13, 2004. Several issues were identified that required additional attention by CFS. A second pre-shipment acceptance test was executed on August 25-27 2004. The equipment was thoroughly tested in both straight vacuum and modified atmosphere sealing modes. Seals and residual gas were tested according to testing protocols for MRE's. The equipment was accepted and released for shipment on August 27, 2004.

3.6 Installation and Testing of the Upgraded Drive

At the recommendation from CFS, the drive motor and controller for the Tiromat was replaced with a Emerson PCM-11 Servo Drive, as the older version, Emerson PMC-1, was not longer supported. Acceptance test of the new drive was conducted at the same time as acceptance testing for the clamping system was performed

3.7 Installation and Testing of Upgraded Control System

The old control system for the Tiromat was based on a PLC-2 and DEC-PDP-11 computer operator interface. This control system was not longer supported by CFS. Based on the recommendation of CFS, the system was upgraded to a PLC-5 with Panel View 1000 Operator Interface. The control software was completely re-written.

Testing and validation of the control system was initially done at on July 12-13, 2004. Several items were identified that needed corrective action. A second validation was performed on August 25-27, 2004. at which time the control system was accepted

3.8 Reinstallation of System at the Demo Facility

The Tiromat was shipped back to the Demo facility on September 14 and installed. CFS performed a startup of the equipment up on September 22-23 and gave training to Rieks Bruins and Jeff Canavan in the operation of the equipment and control system. Both MRE pouch and the Institutional Sized pouch were formed, filled, sealed and cut-out. The MRE pouches met the residual gas and seal strength specifications for MRE pouch.

4 Appendix:

- CFS Proposal P1304C
- CFS Proposal P1374



January 12, 2004

Quote P-1304C

Mr. Rieks Bruins
Rutgers University
120 New England Ave.
Piscataway, NJ 08854

- ▶ Wolfking
- ▶ Krämer+Grebe
- ▶ Scanio
- ▶ Belam
- ▶ Koppens
- ▶ Aquarius
- ▶ Dixie
- ▶ Tiromat
- ▶ TiroPak

Dear Mr. Bruin,

CFS North America Inc. is pleased to submit the following **revised** proposal for a complete rebuild of the forming station and upgrade of the controls system on your existing Tiromat 3000. The revision reflects an approach to this project that will allow CFS to guarantee the forming of military quad-laminate film. There has also been a change in pricing due to the increase in the exchange rate and a change in CFS Service rates.

This document reflects CFS' current understanding of the requirements and our proposed method of meeting them. We appreciate the opportunity to quote on this project and look forward to working with you.

If you have any questions, please don't hesitate to call.

Sincerely,

CFS NORTH AMERICA INC.


Jack Ristuccia
Senior Program Manager

cc: B. Cristina
T. Bayat
M. St. Clair

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8000 North Dallas Parkway
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<http://www.CFS.com>



INTRODUCTION:

This is a revised proposal by *CFS North America Inc.* to upgrade Rutgers's existing Tiromat with a complete rebuild of the forming station and addition of a bladder press to provide consistent clamping pressure during the forming process. The controls system will also be upgraded to an Allen Bradley PLC5 with a PanelView 1000 Operator Panel.

PROJECT OVERVIEW:

This proposal describes the equipment and processes required to accomplish successful forming, and implement the updated control system. Due to the complexity of the work and resources involved in the forming station rebuild and controls upgrade, the machine must be sent to the CFS facility in Frisco, TX. To insure successful implementation and functionality, all upgrades will be completed, tested and accepted prior to shipment back to Rutgers.

The first phase of the project will be to install and test the bladder press. This setup will be done in a prototype mode to prove the feasibility of forming the tri and quad laminate film. After feasibility is achieved, CFS will be able to guarantee the success of the project and the rebuild and controls phase will begin.

Rutgers will be responsible for the following:

Disassembly and shipping from Rutgers to Frisco, TX
Shipping from Frisco, TX to Rutgers
Integration of the Tiromat with the existing ancillary equipment
Sample material for testing and debug

DESCRIPTION:

Forming Station Rebuild

A complete rebuild of the forming station will include the following:

- Replace all bearings, bushings and associated wear parts
- Replace all pneumatic and vacuum valves
- Replace all pneumatic and vacuum tubing
- Reinforce/replace all mechanisms for high pressure application
- Align lifting mechanism and tooling parallelism
- Install high friction gaskets
- Add mounting hardware for bladder press



Bladder Press

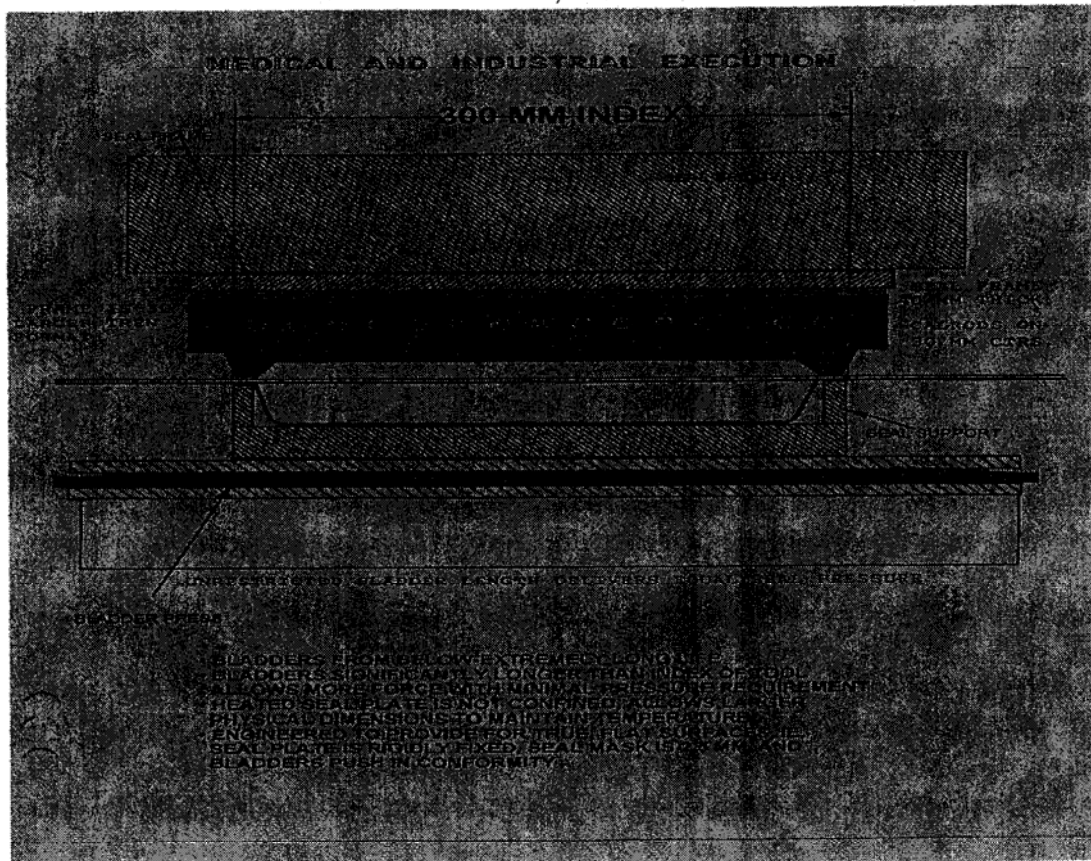
The bladder press system is designed specifically for high-pressure applications where parallelism is essential to ensure even distribution of pressure across the surface of the clamping frame. A new forming die will also be provided with the bladder press

Features

- Bladder clamping from below
- Oversized bladders in machine direction
- Extra thick clamp plate
- Overextended clamp plate

Benefits

- Reduce slippage of film during forming
- More consistent clamping pressure
- Better clamping at outside edge





Controls upgrade

The control system will be updated to an Allen Bradley PLC 5 with a Panel View 1000 Touch Screen for an operator interface. All hardware, wiring, programming, testing and debug are included. Integration with existing ancillary equipment is **not** included.

System Integration/Installation/Training:

Installation includes one mechanical technician for two days. All additional support will be billed on a time and material basis, based on per diem rates of the technical skills required. Travel and living expenses will be invoiced at cost.

CFS Service rates are as follows:

Service Rates:	
Travel:	\$ 75.00/Hr
Technician In-Plant:	\$ 125.00/Hr*
Programmer In-Plant	\$ 200.00/Hr*
Technician Overtime In-Plant:	\$150.00/Hr (over 8 hours a day, weekends and holidays)
Minimum Charge:	\$500.00
Expenses:	*Includes all expenses other than airfare



QUOTATION AND SCHEDULE:

Cost of the proposed equipment is as follows:

Bladder Press & Forming Die	\$16,050.00
Forming Station Rebuild	\$59,675.00
PLC5 and PanelView 1000 Upgrade	\$43,000.00
Tiromat Set-Up at Rutgers	\$3,750.00

TOTAL PRICE **\$122,475.00**

The schedule of delivery is 8 to 10 weeks from receipt of Purchase Order and delivery of the Tiromat to the CFS facility in Frisco, TX.

The payment schedule will be:

- 40% after feasibility and CFS guarantee of forming tri and quad laminate film
- 30% at Design Review prior to Manufacture
- 20% before Shipment
- 10% net 30 days after delivery

All prices are C.I.P. Customers Facility, (Inco Terms 2000) unless otherwise specified.

PROPOSAL CONDITIONS:

Because the application with military quad laminate structures is experimental, CFS cannot guarantee the forming until after prototype testing is complete. If the testing is successful CFS provide a guarantee and continue with the forming station rebuild, controls upgrade and machine setup at Rutgers. If the testing is not successful, the machine will be returned to Rutgers in the "as received" condition without charge for the prototype effort.

This proposal will remain open for 14 days, although, until accepted by you and approved by CFS North America Inc. management, the unit prices and Total Price quoted above are subject to change without notice. This proposal includes the attached Terms and Conditions, which are incorporated into and made part of this agreement.

CFS North America Inc.

Signature: _____

Title: _____

Date of Acceptance: _____

Customer: _____

Signature: _____

Date of Acceptance: _____



1. **Controlling Terms:** These Terms and Conditions govern this sale; any additional or different terms of Customer in any proposal, purchase, order, draft agreement or form will be null and void and of no force or effect. Acceptance of the Equipment constitutes Customer's acceptance of these terms as solely applicable and controlling, notwithstanding usage of trade or course of dealing to the contrary. No modification of these terms shall be binding on CFS North America Inc. without its written consent.

2. **Price; Late Payment; Taxes:** Price does not include taxes or shipping costs and will be paid in immediately available U.S. Dollars and without set-off or counterclaim. Late payments will bear interest at the lesser of one percent per month or the highest rate allowed by law. Customer will pay any sales, use, excise, gross receipts or other taxes (other than taxes imposed on the net income of CFS North America Inc.) levied by any taxing authority with respect to products or services provided to Customer under this agreement. If CFS North America Inc. is required to place a claim for amounts past due from Customer with an attorney for collection, Customer will be liable for CFS North America Inc. reasonable attorneys fees and costs.

3. **Site; Utilities; Permits:** Customer is responsible for site selection and condition, including adequate flooring, drainage, HVAC, lighting, and utility connections, and for any electricity, steam, gas, compressed air, water, or other services required for proper installation and operation of the Equipment. Customer will obtain any permits, licenses, or approvals required by any governmental code, regulation, or ordinance regarding the installation or use of the Equipment.

4. **Delivery; Risk of Loss:** Delivery is F.O.B Frisco, TX (Inco Terms 2000). At Customer's request, CFS North America Inc. will provide bracing, crating, and other protection and will arrange for shipment as Customer's agent. Unless otherwise provided in the proposal, Customer will pay all shipping costs, insurance, and freight immediately upon presentation of verified invoices. Risk of loss or damage to the Equipment passes to Customer upon delivery to the common carrier. Any stated delivery dates are approximate only and subject to change depending on the manufacturing requirements of the Equipment and availability of transport. Customer waives and releases any claims against CFS North America Inc. regarding delivery dates.

5. **Equipment Acceptance:** CFS North America Inc. and Customer will commence Acceptance Testing of the Equipment within five business days following delivery/installation. CFS North America Inc. will execute and deliver the Acceptance Test Certificate to Customer: (i) when the Equipment has been demonstrated in the presence of Customer as capable of performing the Acceptance Test Procedures described in the Specifications; or (ii) when Customer has placed the Equipment into commercial production. Upon execution and delivery of the Acceptance Test Certificate, Customer will make any final payments to CFS North America Inc.

6. **Documentation:** CFS North America Inc. will provide Customer one complete set of all documentation prepared by or available to CFS North America Inc. regarding routine maintenance and operation of the Equipment.

7. **Title; Security Interest:** Title to the Equipment passes to Customer upon final payment. Until payment in full of the Equipment Price (or payment for any replacement parts or services), Customer hereby grants to CFS North America Inc. a purchase money security interest in such Equipment, parts, proceeds, and accessories, to secure payment of the purchase price. Customer authorizes CFS North America Inc. to file or record this Agreement or copy thereof or any UCC statement showing CFS North America Inc.'s interest in the Equipment in all jurisdictions where the Equipment or Customer may be located and Customer will sign all such statements at CFS North America Inc.'s request. Customer will not encumber the Equipment with any mortgage, lien, pledge or other attachment prior to payment in full of the Price.

8. **Software License:** To the extent that the Equipment contains computer software products ("Licensed Products"), CFS North America Inc. grants to Customer a non-exclusive, non-transferable license to use the Licensed Products for Customer's internal business purposes. Customer will not download or reverse engineer or compile any Licensed Product and will not copy any Licensed Products except for backup purposes. Customer will not in any way sub-license the Licensed Products or assign this license, in whole or in part, or otherwise disclose or make available the Licensed Products to third parties. Customer will take reasonable precautions to maintain the confidentiality of the Licensed Products at least equal to those precautions that Customer employs to protect its own information.

11/01



9. **Warranties:** A. CFS North America Inc. warrants that it has good title to the Equipment and transfers same to Customer free of any liens or encumbrances. If the Equipment is found to be defective in material or workmanship for a period of six months from the date of installation, but no longer than the earlier of 9 months from date of shipment F.O.B Frisco, TX or 1200 hours of operation (hereafter "Warranty Period"), then CFS North America Inc. will repair or replace such defective component at its option and expense.

B. **Limited Remedy:** Customer's sole and exclusive remedy for breach of these warranties is the repair or replacement, at CFS North America Inc.'s option and expense, of the defective products or parts, or else at CFS North America Inc.'s election return thereof and refund of the purchase price therefor, for those products or parts for which CFS North America Inc. receives written notice from Customer during the Warranty Period.

C. **Equipment Resale:** CFS North America Inc.'s warranties extend only to Customer and are not assignable to or assumable by any subsequent purchaser, in whole or in part, and any such attempted transfer shall render all warranties provided hereunder null and void and of no further force or effect.

D. **Inspection by CFS North America Inc.:** CFS North America Inc.'s warranty obligations depend on CFS North America Inc. being allowed to inspect the installation, operation, and routine maintenance of the Equipment during the Warranty Period at reasonable times and on reasonable notice to Customer.

E. **Production Data; Advertisements:** Any production data or statistics regarding the Equipment, or any representations or descriptions regarding the Equipment contained in brochures, advertisements, or catalogs, are approximate only and are not guaranteed, and will not create any warranty or other obligation.

F. **Exclusions:** The warranties set forth above are inapplicable to and exclude any defect, damage, or malfunction resulting from (i) normal wear and tear, (ii) misuse, negligence, or modification of the Equipment or any component by Customer or its agents, (iii) repair service provided by third parties, (iv) failure by Customer to follow installation or operating manuals or instructions, (v) failure of parts or components or services not provided by CFS North America Inc., or (vi) any other cause outside CFS North America Inc.'s reasonable control.

THE WARRANTIES SET FORTH ABOVE ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

10. **Extended Maintenance/Customer Support:** Non-warranty Customer Support service will be provided at Customer Site at CFS North America Inc.'s then current hourly rates therefor. For all service, Customer will pay all reasonable travel expenses to and from Site and reasonable living expenses. Minimum service call is two hours plus expenses. All rates are subject to change on 30 days notice to Customer.

11. **Consequential Damages:** CFS North America Inc. will not be liable for and Customer hereby waives and releases any claims against CFS North America Inc. for any special, incidental, indirect, exemplary or consequential damages, including lost sales, revenues or profit, loss or return of or damage to product, loss of facilities, inventory, work-in-process, or time and materials, or loss of prospective economic advantage, arising from any performance or failure to perform by CFS North America Inc. or its employees or subcontractors under this Agreement, or from the breach of any warranty hereunder.

12. **Limitation of Liability:** In no event will CFS North America Inc.'s liability for any failure of performance or other breach of this Agreement or of any warranty hereunder exceed the Equipment price paid by Customer, and Customer hereby waives and releases any claims against CFS North America Inc. in excess of such Equipment price.

13. **Patent Indemnity:** A. CFS North America Inc. will defend, indemnify, and hold harmless Customer from and against any and all liability, claims, suits, damages, judgments, costs, and expenses, including reasonable attorneys' fees, incurred by Customer as a result of any claims that the Equipment or any component or documentation provided to Customer by CFS North America Inc. (collectively "CFS North America Inc. Product") infringes any patent, copyright, trade secret, trademark or other proprietary right.

B. Customer will defend, indemnify, and hold harmless CFS North America Inc. from and against any and all liability, claims, suits, damages, judgments, costs, and expenses, including reasonable attorneys' fees, incurred by CFS North America Inc. as a result of any claims that any product produced by or for the Customer on the Equipment or any component thereof infringes any patent, copyright, trade secret, trademark or other proprietary right.



C. The party seeking indemnification from any claim, suit, or demand described in subsections A or B above shall promptly notify the other party ("Indemnitor") upon receiving notice thereof, and will provide the Indemnitor with available information and cooperate in the defense of the claim. The Indemnitor will defend or settle at its expense any and all such claims, including any settlement negotiations or appeals. If at any time Customer's use of any CFS North America Inc. Product is enjoined or restricted as a result of a claim, suit, or demand described in subsection A above, CFS North America Inc. may elect at its expense (i) to secure for Customer the right to use of the CFS North America Inc. Product, (ii) to replace the CFS North America Inc. Product with another product reasonably acceptable to Customer, or (iii) to accept return of the CFS North America Inc. Product and refund to Customer the then-current fair market value of the CFS North America Inc. Product.

14. **Indemnification:** Customer will defend, indemnify, and hold harmless CFS North America Inc., its officers, employees, and agents (collectively "CFS Indemnitees") against and from any and all liability, claims, suits, judgments, damages, or costs (including reasonable attorneys' fees and expenses) resulting from any claim, suit or demand by any third party (including claims allegedly arising from the active or passive negligence of Customer or CFS Indemnitees in connection therewith) for injuries to or deaths of person or loss of or damage to property arising out of (i) use of the Equipment by Customer, (ii) use of facilities, services, materials, data, or information not provided by CFS Indemnitees, (iii) use of non-genuine, "knock-off" or "pirate" parts, or (iv) compliance by CFS Indemnitees with any request or instruction by Customer, except to the extent caused by the gross negligence or willful misconduct of CFS Indemnitees. This indemnification will survive termination of this Agreement.

15. **Insurance:** Customer at its expense will obtain and maintain in full force and effect comprehensive general liability insurance of at least \$1,000,000 per person/\$2,000,000 per occurrence for public liability and \$2,000,000 per occurrence for property damage. Such insurance will be endorsed to name CFS North America Inc. as an additional insured to the extent of the risk of loss and indemnification obligations assumed by Customer under this Agreement. Certificates evidencing such coverage will be provided to CFS North America Inc. upon request.

16. **Force Majeure:** Neither party will be liable for delays in or suspension of performance (other than the obligation to pay for services rendered and goods sold and delivered) caused by acts of God or governmental authority, strikes or labor disputes,

accident, flood, fires or other loss of manufacturing facilities, lack of adequate fuel, power, raw materials, labor, or transportation facilities, breach by suppliers of supply agreements, or any other cause, whether similar or dissimilar, beyond the reasonable control of that party.

17. **Publicity:** CFS North America Inc. may refer to Customer as a customer reference in non-public dealings with potential customers and financial concerns. Neither Party will refer to this agreement or use the name of the other party in any form of publicity or advertising, either directly or indirectly, without the prior written consent of the other party.

18. **Proprietary Rights:** CFS North America Inc. retains all right, title, and interest in and to any improvement, invention, copyright, patent, trade secret or other intellectual property developed by CFS North America Inc. under this Agreement ("CFS North America Inc. Development"). No license is granted to Customer regarding any CFS North America Inc. Development and Customer hereby waives and releases and assigns to CFS North America Inc. any right, title, or interest that Customer may have to any CFS North America Inc. Development.

19. **General:** This Agreement may be amended only by written agreement of the parties executed by their authorized representatives. CFS North America Inc. may assign this Agreement to a parent, affiliate, or financial concern. This Agreement may not be otherwise assigned in whole or in part, and any such assignment will be void and of no force or effect. This Agreement will not create any right in or obligation to any third party. No waiver by either party of any default or breach by the other party will operate as or be deemed a waiver of any subsequent default or breach. This Agreement, and any dispute arising under or with respect to this Agreement, will be construed in accordance with and governed by the internal laws of Texas. The parties hereby consent to the non-exclusive jurisdiction of the state and federal courts in Dallas, Texas.

20. **Entirety of Agreement:** This agreement supersedes all prior oral or written representations, communications, or agreements between the parties regarding the subject matter of this Agreement (including, without limitation, any purchase order or other form), and, together with any attachments, constitutes the final and entire understanding of the parties, regarding the subject matter of this Agreement.
11/01

CFS goes Slicing!



Via: Mail

Mr. Rieks Bruins
Rutgers
120 New England Avenue
Piscataway, NJ 08854

April 19, 2004
JBR

Ref.: Quotation P-1374

Dear Mr. Bruins:

I am pleased to provide you with Quotation P-1374 for an Emerson PCM-11 Servo-Drive Upgrade. The Emerson PMC-1 Drive in Rutgers existing Tiromat 3000 SN 765/3001 is obsolete and will be upgraded with an Emerson PCM-11.

Should you have any questions and/or comments, please do not hesitate to contact me on my cell at 214-618-1146. We look forward to receiving your order, and we thank you for the opportunity to quote on this project.

Sincerely,

CFS North America, Inc.

Jack Ristuccia mb

Jack Ristuccia
Sr. Project Manager

Enclosures

CC: Tony Bayat
Mike St. Clair

Quotation

NO. P-1374
Rutgers - Piscataway, NJ



Project Overview:

This proposal covers the upgrade of the Emerson Drive while the Tiromat is at CFSNA in Frisco, TX. All hardware will be installed, wired, programmed, and completely tested before shipment to Rutgers. The PCM-11 is equipped with adjustable acceleration, deceleration, and velocity.

The equipment being supplied includes the following:

Emerson PCM-11 Drive
Operator Terminal
Serial Cable
Amplifier

Equipment Summary		Price (USD)
Emerson PCM-11 Upgrade		\$17,900.00
Total (USD)		\$17,900.00

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Rutgers - Piscataway, NJ



Commercial Terms

Approximate Ship Date:

6 to 8 working weeks from receipt of the order, down payment, and finalization of technical details.

Delivery Terms:

CIP Rutgers (Piscataway, NJ)

Common Carrier

Freight and insurance will be billed separately.

Delivery Address:

Rutgers
Att:Rieks Bruins
120 New England Avenue
Piscataway, NJ 08854

Ph: 732-445-6135

Payment Terms:

45% due with order

45% due prior to shipment

10% due upon the earlier of: completed installation or net 30 days

Quotation Validity:

30 days, subject to the currency clause below.

Currency Clause:

If the currency exchange rate between the United States and the country of manufacture of the equipment listed in this proposal fluctuates by more than three percent (3%) during that valid quotation period, either party may initiate a renegotiation of the price quoted above. All prices quoted are based upon the receipt by CFS North America, Inc. of a signed Order Confirmation, written P.O. and/or down payment. Subsequent price changes may affect the prices quoted.



Installation Terms

Supervision of Installation and Training

Supervision of Installation of the equipment is not included as part of this proposal.

CFS will provide a technician at the customer's plant for **zero (0)** business days, travel time included (Monday through Friday 8:00 a.m. to 5:00 p.m., excluding weekends and holidays). This is part of the original purchase, and includes start-up and training.

If any overtime work beyond the scope described in this document is required by the customer, CFS shall be reimbursed for the overtime premium portion differential between the regular hourly rate and the overtime rate. The overtime premium rate is \$35.00 per man hour.

Additional support and training time beyond the original scope of supply and service will be available at a cost of \$1,000.00 per eight (8) hours. Weekend or holiday technical support will be provided at a cost of \$1,200.00 per eight (8) hour day. All expenses except for airfare are included in the daily rate.

Equipment Hand-Over Process

Commencing with the successful installation and commissioning of the equipment herein described, a **Hand-Over Certificate** will be generated by CFS and signed by both parties prior to the start of production. Should any technical issues with the equipment remain open at the time of the hand-over, all such issues will be documented on a punch-list within the Hand-Over Certificate along with target completion dates. In case installation is not included as part of CFS' scope of supply, the hand-over date will be the Ex Works delivery date.

Please Note: The equipment cannot be taken into regular production prior to signing the Hand-Over Certificate. The warranty period will commence from the date of hand-over of the equipment in accordance with the Terms & Conditions set forth in this document.

Statement of additional delay cost assignment:

CFS will make every effort for on time completion of the installation of CFS equipment and is prepared for minor and normal construction / installation delays, however, if there are prolonged delays, whether foreseen or unforeseen, which are due to factors beyond CFS control, CFS may opt for temporary removal of the CFS installation team from the installation site, and the customer will be held accountable for all costs related to such temporary removal, such as all transportation charges, temporary storage charges, lost work, and travel hours.

Storage of Equipment:

The customer is responsible for the cost of storing equipment due to delays in the original project schedule caused by the customer, including but not limited to the site not being ready to receive the equipment, lack of utilities, ... etc. If storage is required for the equipment, the customer must provide suitable storage, which is safe and dry. Storage temperatures should remain between 45 and 90 degrees Fahrenheit and relative humidity should be less than 50%. The customer is responsible for any damages and/or deterioration to the equipment during storage and any associated transfer of the equipment.

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Rutgers - Piscataway, NJ

Quotation



CFS/Customer Responsibility List

(As Applicable)

	Customer	CFS
Safety		
Conduct on-site plant safety orientation prior to start of installation	X	
Provide HACCP rules and regulations that must be followed	X	
Project Management		
Provide final equipment drawings and layouts		X
Provide project schedule	X	X
Provide contact list for individuals involved in project	X	X
Approval of all change orders	X	X
Permits as required for installation	X	
Building / Site		
Any building related work including structural supports for equipment and plant floor preparation. Building/floor must be structurally adequate to handle the loads of the equipment.	X	
Utilities. Provide all utilities required to operate the equipment, including all piping and connections to the equipment. Utilities include but are not limited to air, electrical, water, steam, gas, CO2, etc. Customer to provide conduit and wireways for electrical wiring including control wiring. Customer to pull wiring through the building to and from any remote control panels to the equipment. (Please refer to the utility spec sheet for equipment specific information).	X	
Utilities required for equipment installation (air, water, electrical, mechanical)	X	
Mechanical systems (cooling, heat, ventilation, make-up air, etc.) as required keeping the equipment operating at peak efficiency.	X	
Safe and secure work area free of debris and other job related hazards. Jobsite must comply with all OSHA regulations.	X	
Provide safe secure place to store gang box and misc. tools required for the installation of the equipment.	X	
Provide washroom / restroom access	X	
Any local and national permits required to install and operate the equipment	X	
Installation		
Transportation of equipment to customer site		X
Rigging. Provide cranes, rigging equipment and manpower to safely offload equipment from trucks and place into final location in building. Note: CFS will not be responsible for any damage to the equipment as a result of improper material handling and rigging.	X	
Uncrating of equipment	X	
Removal of crating material	X	
Transportation of equipment into building and placing in final location.	X	
Leveling of equipment	X	X
Assembly of equipment		X
Tools required to install the equipment		X
Provide start-up & commissioning		X
Provide (2) sets of documentations.		X
Provide on site training as stated in quote. Note: Customer must make personnel available for un-interrupted training.		X
Final walkthrough and acceptance of equipment	X	X
Supplies		
Provide dumpsters for trash removal	X	

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Rutgers - Piscataway, NJ



TERMS AND CONDITIONS

1. Controlling Terms: These Terms and Conditions govern this sale; any additional or different terms of Customer in any proposal, purchase, order, draft agreement or form will be null and void and of no force or effect. Acceptance of the Equipment constitutes Customer's acceptance of these terms as solely applicable and controlling, notwithstanding usage of trade or course of dealing to the contrary. No modification of these terms shall be binding on CFS North America, Inc. without its written consent.
2. Price; Late Payment; Taxes: Price does not include taxes or shipping costs and will be paid in immediately available U.S. Dollars and without set-off or counterclaim. Late payments will bear interest at the lesser of one percent per month or the highest rate allowed by law. Customer will pay any sales, use, excise, gross receipts or other taxes (other than taxes imposed on the net income of CFS North America, Inc.) levied by any taxing authority with respect to products or services provided to Customer under this agreement. If CFS North America, Inc. is required to place a claim for amounts past due from Customer with an attorney for collection, Customer will be liable for CFS North America, Inc. reasonable attorneys fees and costs.
3. Site; Utilities; Permits: Customer is responsible for site selection and condition, including adequate flooring, drainage, HVAC, lighting, and utility connections, and for any electricity, steam, gas, compressed air, water, or other services required for proper installation and operation of the Equipment. Customer will obtain any permits, licenses, or approvals required by any governmental code, regulation, or ordinance regarding the installation or use of the Equipment.
4. Delivery; Risk of Loss: Delivery is CIF Customers Facility (Inco Terms 2000). At Customer's request, CFS North America, Inc. will provide bracing, crating, and other protection and will arrange for shipment as Customer's agent. Unless otherwise provided in the proposal, Customer will pay all shipping costs, insurance, and freight immediately upon presentation of verified invoices. Risk of loss or damage to the Equipment passes to Customer upon delivery to the common carrier. Any stated delivery dates are approximate only and subject to change depending on the manufacturing requirements of the Equipment and availability of transport. Customer waives and releases any claims against CFS North America, Inc. regarding delivery dates.
5. Equipment Acceptance: CFS North America, Inc. and Customer will commence Acceptance Testing of the Equipment within five business days following delivery/installation. CFS North America, Inc. will execute and deliver the Acceptance Test Certificate to Customer: (i) when the Equipment has been demonstrated in the presence of Customer as capable of performing the Acceptance Test Procedures described in the Specifications; or (ii) when Customer has placed the Equipment into commercial production. Upon execution and delivery of the Acceptance Test Certificate, Customer will make any final payments to CFS North America, Inc.
6. Documentation: CFS North America, Inc. will provide Customer one complete set of all documentation prepared by or available to CFS North America, Inc. regarding routine maintenance and operation of the Equipment.
7. Title; Security Interest: Title to the Equipment passes to Customer upon final payment. Until payment in full of the Equipment Price (or payment for any replacement parts or services), Customer hereby grants to CFS North America, Inc. a purchase money security interest in such Equipment, parts, proceeds, and accessories, to secure payment of the purchase price. Customer authorizes CFS North America, Inc. to file or record this Agreement or copy thereof or any UCC statement showing CFS North America, Inc.'s interest in the Equipment in all jurisdictions where the Equipment or Customer may be located and Customer will sign all such statements at CFS North America, Inc.'s request. Customer will not encumber the Equipment with any mortgage, lien, pledge or other attachment prior to payment in full of the Price.
8. Software License: To the extent that the Equipment contains computer software products ("Licensed Products"), CFS North America, Inc. grants to Customer a non-exclusive, non-transferable license to use the Licensed Products for Customer's internal business purposes. Customer will not download or reverse engineer or compile any Licensed Product and will not copy any Licensed Products except for backup purposes. Customer will not in any way sub-license the Licensed Products or assign this license, in whole or in part, or otherwise disclose or make available the Licensed Products to third parties. Customer will take reasonable precautions to maintain the confidentiality of the Licensed Products at least equal to those precautions that Customer employs to protect its own proprietary information.



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9. Warranties: A. CFS North America, Inc. warrants that it has good title to the Equipment and transfers same to Customer free of any liens or encumbrances. If the Equipment is found to be defective in material or workmanship for a period of six months from the date of installation, but no longer than the earlier of 9 months from date of shipment CIP Customers Facility or 1200 hours of operation (hereafter "Warranty Period"), then CFS North America, Inc. will repair or replace such defective component at its option and expense.

B. Limited Remedy: Customer's sole and exclusive remedy for breach of these warranties is the repair or replacement, at CFS North America, Inc.'s option and expense, of the defective products or parts, or else at CFS North America, Inc.'s election return thereof and refund of the purchase price therefore, for those products or parts for which CFS North America, Inc. receives written notice from Customer during the Warranty Period.

C. Equipment Resale: CFS North America, Inc.'s warranties extend only to Customer and are not assignable to or assumable by any subsequent purchaser, in whole or in part, and any such attempted transfer shall render all warranties provided hereunder null and void and of no further force or effect.

D. Inspection by Convenience Food Systems Inc.: CFS North America, Inc.'s warranty obligations depend on CFS North America, Inc. being allowed to inspect the installation, operation, and routine maintenance of the Equipment during the Warranty Period at reasonable times and on reasonable notice to Customer.

E. Production Data; Advertisements: Any production data or statistics regarding the Equipment, or any representations or descriptions regarding the Equipment contained in brochures, advertisements, or catalogs, are approximate only and are not guaranteed, and will not create any warranty or other obligation.

F. Exclusions: The warranties set forth above are inapplicable to and exclude any defect, damage, or malfunction resulting from (i) normal wear and tear, (ii) misuse, negligence, or modification of the Equipment or any component by Customer or its agents, (iii) repair service provided by third parties, (iv) failure by Customer to follow installation or operating manuals or instructions, (v) failure of parts or components or services not provided by CFS North America, Inc., or (vi) any other cause outside CFS North America, Inc.'s reasonable control.

THE WARRANTIES SET FORTH ABOVE ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

10. Extended Maintenance/Customer Support: Non-warranty Customer Support service will be provided at Customer Site at CFS North America, Inc.'s then current hourly rates therefore. For all service, Customer will pay all reasonable travel expenses to and from Site and reasonable living expenses. Minimum service call is two hours plus expenses. All rates are subject to change on 30 days notice to Customer.

11. Consequential Damages: CFS North America, Inc. will not be liable for and Customer hereby waives and releases any claims against CFS North America, Inc. for any special, incidental, indirect, exemplary or consequential damages, including lost sales, revenues or profit, loss or return of or damage to product, loss of facilities, inventory, work-in-process, or time and materials, or loss of prospective economic advantage, arising from any performance or failure to perform by CFS North America, Inc. or its employees or subcontractors under this Agreement, or from the breach of any warranty hereunder.

12. Limitation of Liability: In no event will CFS North America, Inc.'s liability for any failure of performance or other breach of this Agreement or of any warranty hereunder exceed the Equipment price paid by Customer, and Customer hereby waives and releases any claims against CFS North America, Inc. in excess of such Equipment price.

13. Patent Indemnity: A. CFS North America, Inc. will defend, indemnify, and hold harmless Customer from and against any and all liability, claims, suits, damages, judgments, costs, and expenses, including reasonable attorneys' fees, incurred by Customer as a result of any claims that the Equipment or any component or documentation provided to Customer by CFS North America, Inc. (collectively "CFS North America, Inc. Product") infringes any patent, copyright, trade secret, trademark or other proprietary right.

B. Customer will defend, indemnify, and hold harmless CFS North America, Inc. from and against any and all liability, claims, suits, damages, judgments, costs, and expenses, including reasonable attorneys' fees, incurred by CFS North America, Inc. as a result of any claims that any product produced by or for the Customer on the Equipment or any component thereof infringes any patent, copyright, trade secret, trademark or other proprietary right.



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C. The party seeking indemnification from any claim, suit, or demand described in subsections A or B above shall promptly notify the other party ("Indemnitor") upon receiving notice thereof, and will provide the Indemnitor with available information and cooperate in the defense of the claim. The Indemnitor will defend or settle at its expense any and all such claims, including any settlement negotiations or appeals. If at any time Customer's use of any CFS North America, Inc. Product is enjoined or restricted as a result of a claim, suit, or demand described in subsection A above, CFS North America, Inc. may elect at its expense (i) to secure for Customer the right to use of the CFS North America, Inc. Product, (ii) to replace the CFS North America, Inc. Product with another product reasonably acceptable to Customer, or (iii) to accept return of the CFS North America, Inc. Product and refund to Customer the then-current fair market value of the CFS North America, Inc. Product.

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and delivered) caused by acts of God or governmental authority, strikes or labor disputes, accident, flood, fires or other loss of manufacturing, facilities, lack of adequate fuel, power, raw materials, labor, or transportation facilities, breach by suppliers of supply agreements, or any other cause, whether similar or dissimilar, beyond the reasonable control of that party.

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20. Entirety of Agreement: This agreement supersedes all prior oral or written representations, communications, or agreements between the parties regarding the subject matter of this Agreement (including, without limitation, any purchase order or other form), and, together with any attachments, constitutes the final and entire understanding of the parties, regarding the subject matter of this Agreement.

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